Spot Safety Project Evaluation

Project Log # 200512179

Spot Safety Project # 07-00-200

Spot Safety Project Evaluation of the Realignment of SR 1136 (Bellemont Rd-Alamance Rd) and Its Intersection with NC 62. Also Includes Installation of Left Turn Lanes on NC 62 for Its Intersections With SR 1136 and SR 1130 (Friendship-Patterson Mill Rd)
Alamance County

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation

Principal Investigator

_____ 03-20-2006
Brad Robinson, EI Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 07-00-200 – The Intersections of NC 62 and SR 1136 (Bellemont Rd-Alamance Rd) and NC 62 and SR 1130 (Friendship-Patterson Mill Rd) in Alamance County.

Introduction

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naive before and after analysis of the treatment versus comparison data has been completed to measure the effectiveness of the spot safety improvement. Additional analysis methods were not utilized for this evaluation because a suitable comparison group was unattainable. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasures chosen for the subject location was the installation of left turn lanes on NC 62 and the realignment of SR 1136 to "tee" into the center of the curve on NC 62. NC 62 is a 2-lane facility with a speed limit of 45 mph for the southern approach and a speed limit of 35 mph for the northern approach due to a school zone. SR 1130 is a 2-lane facility with a speed limit of 45 and no turn lanes. SR 1136 is a 2-lane facility with a speed limit of 45 mph. Before the project, SR 1136 had a concrete median splitting it into two legs allowing easier access to NC 62. Please see *Collision Diagram, Before Period* for more detail.

The initial statement of problem was that vehicles entering and exiting SR 1136/1130 could not safely enter the intersection due to insufficient gaps in traffic. The reason given for the countermeasures was to improve delay problems. Presumably vehicles waiting to turn left off of NC 62 felt rushed to make the turn and therefore did not choose sufficient gaps.

The initial crash analysis for this intersection was completed November 1, 1996 to October 31, 1999 which yielded 9 total crashes. A total of 5 of these were deemed correctable by the improvements: 2 Left Turn-Same Roadway, 2 Rear-end, and 1 Left-Turn Different Roadway. The final completion date for the construction of the flashing traffic signal was November 3, 2001 with a total cost of $200,000. $50,000 was funded by Spot Safety funds, while the remaining $150,000 was funded by Mr. Douglas Galyon, Member of the Board of Transportation.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from September 1, 2001 to January 31, 2002. The before period consisted of reported crashes from December 1, 1997 through August 31, 2001 (3 Years, 9 Months) and the after period consisted of reported crashes from February 1, 2002 through October 31, 2005 (3 Years, 9 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The treatment data consisted of all crashes on a strip along NC 62 from 150 feet south-west of the SR 1130 turn lane taper and 150 feet north of the SR 1136 turn lane taper. A 150' Y line was used in order to include crashes on SR 1136 and SR 1130. The following data table depicts the Naive Before and After Analysis for the above information. Please note Left Turn-Same Roadway, Rear-end (along NC 62 near the intersections), and Left Turn-Different Roadway (involving a left turn from NC 62) crashes were the target crashes for the applied countermeasures.

Treatment Information

	Before	After	Percent Reduction (-) Percent Increase (+)
Total crashes	24	6	-75.0
Total Severity Index	6.32	3.47	-45.1
Target Crashes	9	1	-88.9
Target Severity Index	4.29	8.4	95.8
Volume	6800	9100	33.8

The naive before and after analysis at the treatment location resulted in a 75.0 percent decrease in Total Crashes, an 88.9 percent decrease in Target Crashes, and a 33.8 percent increase in Average Daily Traffic (ADT). The before period ADT year was 1999 and the after period ADT year was 2003.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 75.0 percent decrease in Total Crashes and an 88.9 percent decrease in Target Crashes, although the volume increased 33.8 percent. The summary results above demonstrate that the treatment location appears to have had a decrease in both Total Crashes and Target crashes from the before to the after period.

There was a 95.8 percent increase in the Target Crash Severity Index, although this is misleading. In the before period, there were 8 left turn and 1 rear-end crashes, all with at most a class C injury. In the after period there was only 1 left turn crash with a class B injury and no rear-end collisions.

There was a fatality at the subject location in the before period, less than 5 months after the initial study's ending date. It involved a vehicle running the stop sign on SR 1130 at a high rate of speed

and colliding with a southwest bound vehicle on NC 62. This type of crash was not a target crash for the improvement countermeasures.

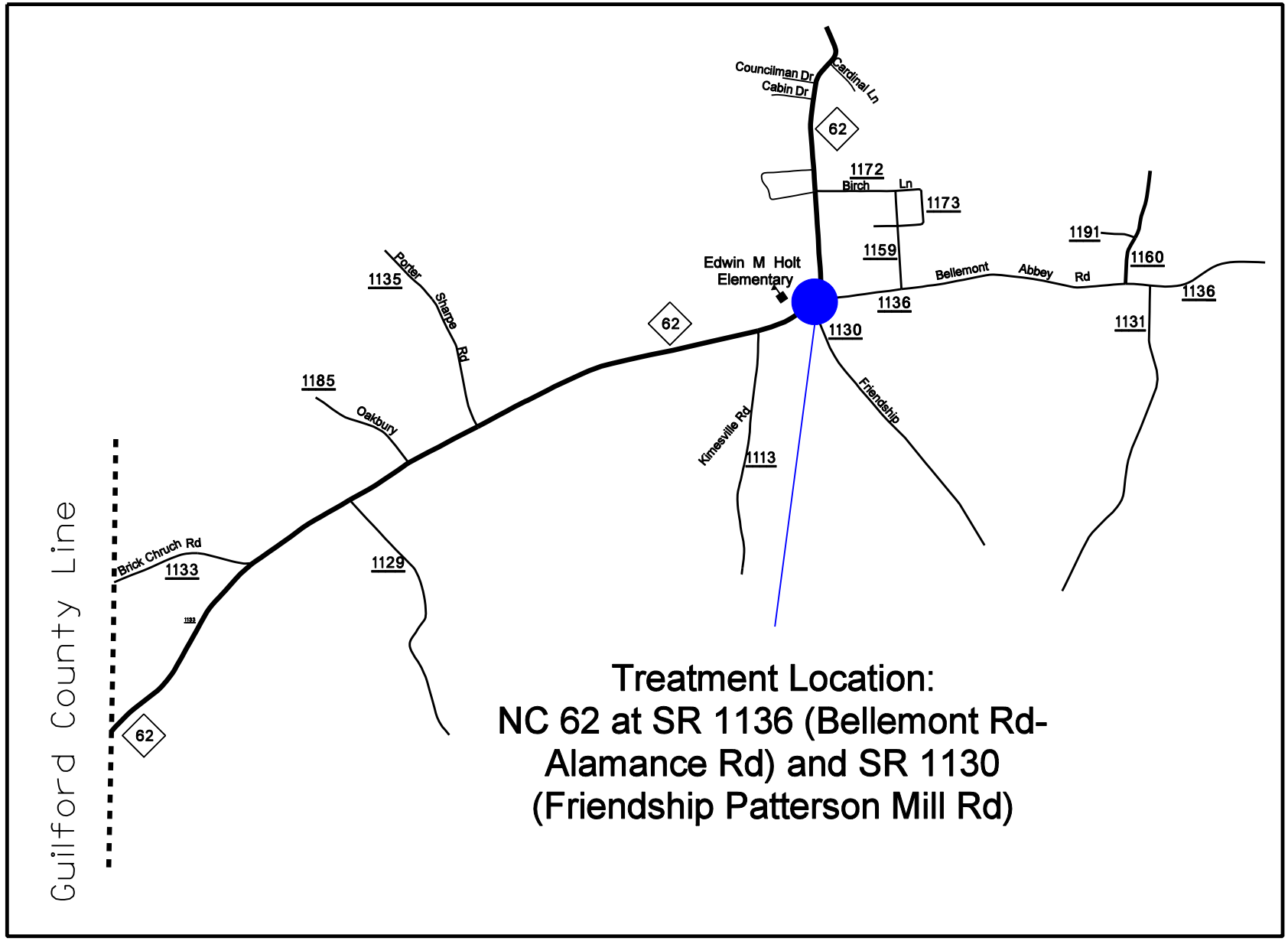
The addition of left turn lanes on NC 62 reduced the left turn-same roadway crashes on NC 62 onto SR 1136 from 4 to 1 from the before to the after period and reduced the same type of movement onto SR 1130 from 1 to 0. It appears that because the turn lanes provide a refuge for the left turning vehicles to wait for a sufficient gap in traffic, the drivers are using better judgement when crossing the intersection.

Referencing the *Collision Diagram, Before Period* there appears to have been an existing pattern of crashes between the two legs of SR 1136 at the intersection. The realignment of the intersection eliminated this movement, therefore eliminating the pattern of crashes.

Please see the attached *Treatment Site Photos*. Photos are proved for all approaches to the intersection, as well as site distances from both SR 1130 and SR 1136.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of intersection.

Location Map
Alamance County
Evaluation of Spot Safety Project 07-00-200



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TREATMENT SITE PHOTOS TAKEN 3/9/2006

Traveling North on NC 62 – Start of Taper

Traveling North on NC 62 – SR 1130 Seen to the Right

Traveling North on NC 62 – SR 1136 Seen to the Right

Traveling South on NC 62 – Start of Taper

Traveling South on NC 62 – SR 1136 Seen to the Left

Traveling South on NC 62 – SR 1130 Seen to the Left

Traveling West on SR 1136 (Bellemont-Alamance Rd)

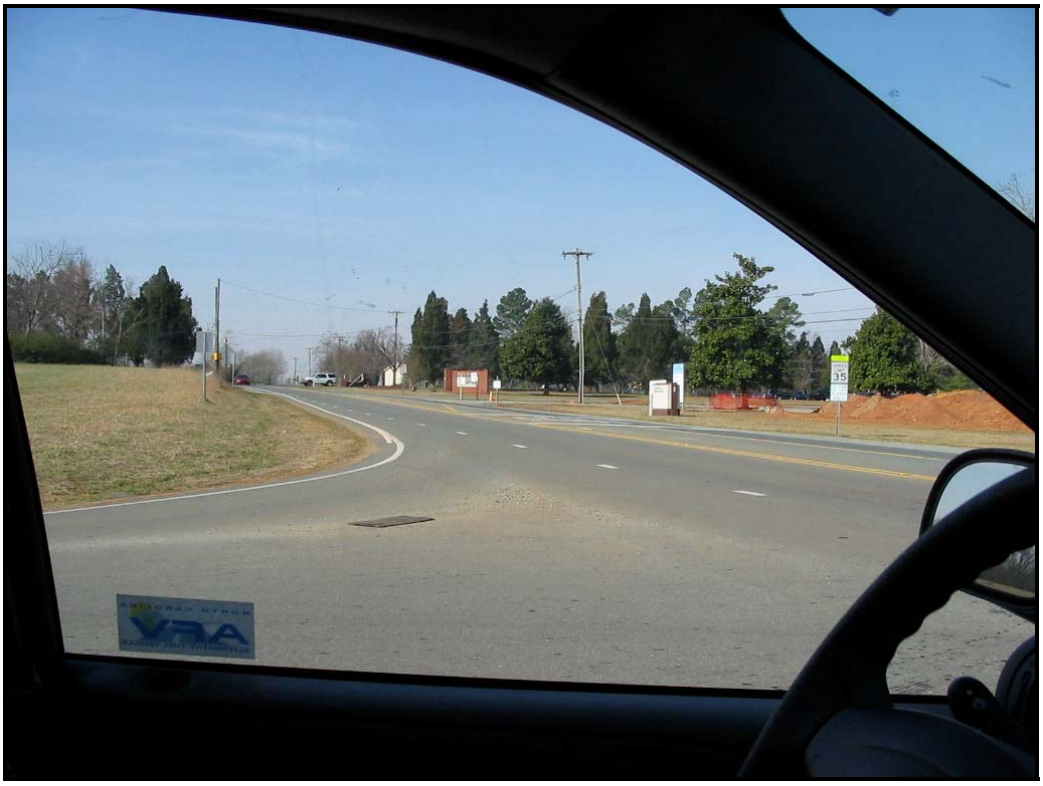
Traveling West on SR 1136

Looking Right From SR 1136 (Bellemont-Alamance Rd)

Looking Left From SR 1136

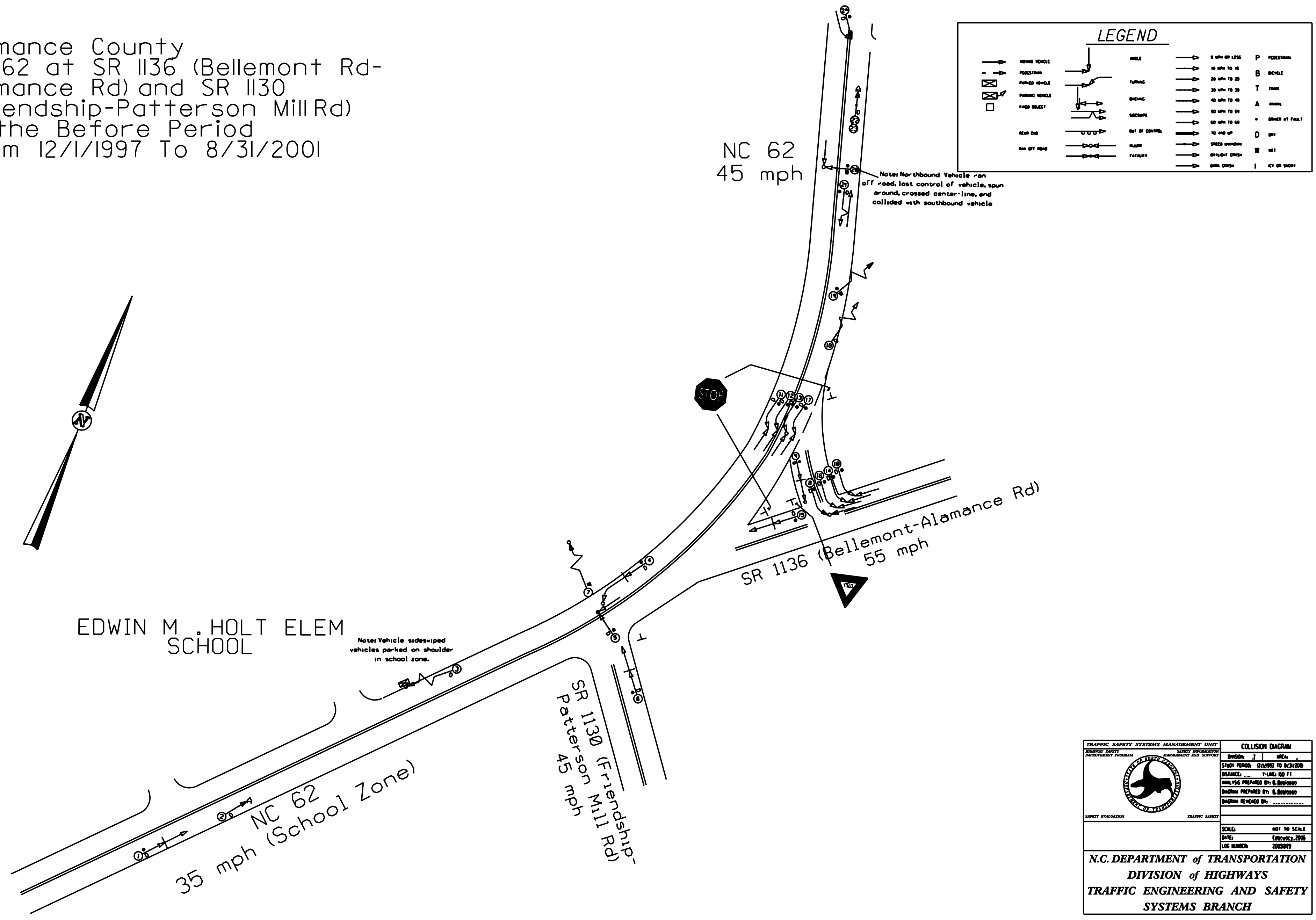
Traveling Northwest on SR 1130 (Friendship-Patterson Mill Rd)

Looking Right From SR 1130 (Friendship-Patterson Mill Rd)



Looking Left From SR 1130

Alamance County
NC 62 at SR 1136 (Bellemont Rd-Alamance Rd) and SR 1130 (Friendship-Patterson Mill Rd)
In the Before Period
From 12/1/1997 To 8/31/2001



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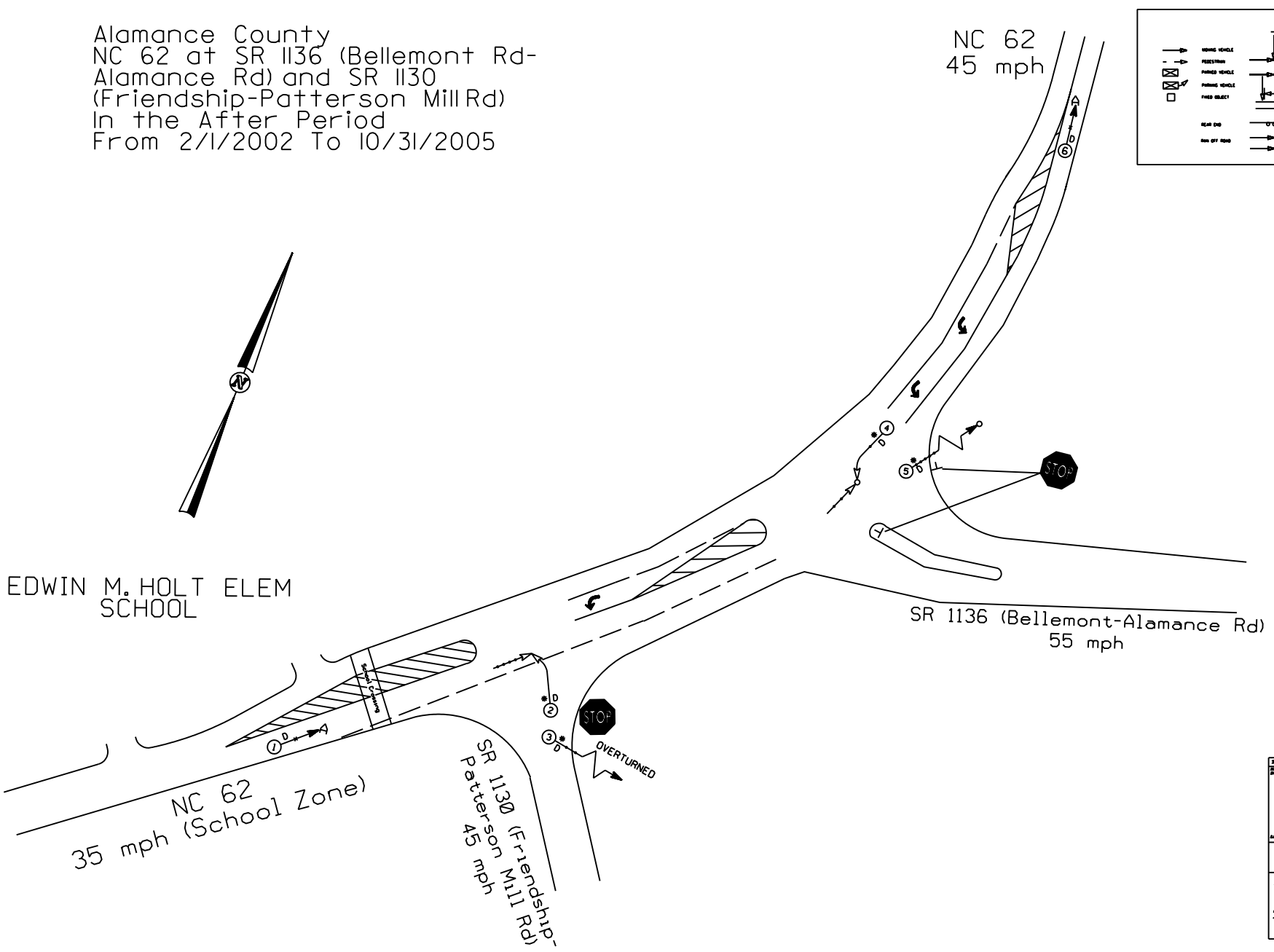
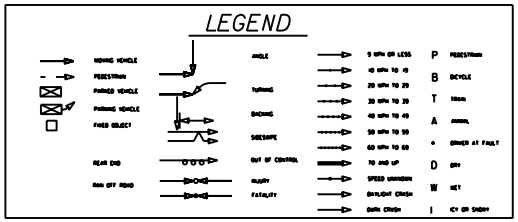
Alamance County
NC 62 at SR 1136 (Bellemont Rd-Alamance Rd) and SR 1130 (Friendship-Patterson Mill Rd)
In the After Period
From 2/1/2002 To 10/31/2005





TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

COLLISION DIAGRAM

DIVISION: 7 AREA:
STUDY PERIOD: 2/1/2002 TO 10/31/2005
DISTANCE: 1 inch= 50 FT
ANALYSIS PREPARED BY: B.Robinson
DIAGRAM PREPARED BY: B.Robinson
DIAGRAM REVIEWED BY:
SCALE: NOT TO SCALE
DATE: 1/DECEMBER/2006
LOG NUMBER: 20050119

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

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